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SCIENCE NEWS LETTER

THE WEEKLY SUMMARY OF CURRENT SCIENCE

A SCIENCE SERVICE PUBLICATION

GENERAL SCIENCE

Top Two of Forty Winners

Robert J. Kolenkow, 17-year-old from Niagara Falls, N. Y., who constructed an electric calculator, won the $2,800 award. Frederick J. Ernst, Jr., also of New York, won $2,000.

See Front Cover

➤ THE MOST outstanding scientist among the nation's high school seniors is Robert J. Kolenkow, 17, Niagara Falls, N. Y. He was awarded the $2,800 Westinghouse Grand Science Scholarship at the banquet in Washington, D. C., which climaxed the Tenth Annual Science Talent Search.

The awards of all the scholarships to the 40 top winners were made by Dr. Harlow Shapley, director of the Harvard Observatory and President of Science Service.

Second highest honors, a $2,000 scholarship, went to Frederick J. Ernst, Jr., 17, a senior at Ardsley (N. Y.) High School. The leader among the girls was Rhea Mendoza, 16, who attends Forest Hills (N. Y.) High School. She received a $400 scholarship.

Mr. Kolenkow's project — which helped him win top position—was the construction of an electric calculator. It cost about $40, contained 66 hand-made relays and can serve as a three-dimensional text book to illustrate how the much more complex "brains" work.

Mr. Ernst wrote a report on "A Relativistic Explanation of Gravitational Acceleration of Falling Bodies near the Earth." It is a mathematical treatise and Mr. Ernst refers his readers to Einstein's Theory of Relativity for the background necessary to understand what he is saying.

The two winners are shown on the front cover of this week's SCIENCE NEWS LETTER, Frederick Ernst on the left and Robert Kolenkow on the right.

Miss Mendoza, an aspiring biologist, investigated the nature of the odor given off by the confused flour beetle.

Seven other $400 scholarships and 30 $100 scholarships were also awarded. The 40 young scientists also heard an address by Atomic Energy Commissioner Henry D. Smyth.

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GENERAL SCIENCE

Winners of Scholarships

GRAND SCHOLARSHIP OF $2,800

Kolenkow, Robert John, Niagara Falls, N. Y.

$2,000 SCHOLARSHIP AND ALTERNATE TO $2,800

Ernst, Frederick Joseph, Jr., Ardsley, N. Y.

ALTERNATE FOR $2,000

Simpson, Robert Edmund, Kenmore, N. Y.

SCHOLARSHIPS OF $400

Berkelman, Karl, Lewiston, Maine
Chester, Conrad Vences, Roslyn Heights, N. Y.
Mendoza, Rhea, Forest Hills, N. Y.
Schneider, Peter Bernard, New York, N. Y.
Simpson, Robert Edmund, Kenmore, N. Y.
Spangler, Robert Alan, Celina, Ohio
Thomson, Richard Mansfield, Delmar, N. Y.
Wheeler, Nicholas Allan, The Dalles, Oreg.

ALTERNATES

1st alt. Sibilia, John Talbot, Newark, N. J.
2nd alt. Drauglis, Edmund, Philadelphia, Pa.
3rd alt. Feldstein, Robert Schmidt, New York, N. Y.

SCHOLARSHIPS OF $100

Botkin, Dorothy Ann, Croton-on-Hudson, N. Y.
Braverman, Paul Maxim, Brooklyn, N. Y.
Brush, Stephen George, Orono, Maine
Butler, James Newton, Lakewood, Ohio
Chambers, Derrell Lynn, Paso Robles, Calif.
Cowan, James Jones, III, Maryville, Tenn.
Cummisford, Patricia Diane, Arlington Heights, Ill.
De Decker, Carol Lynne, Independence, Calif.
Demkovich, John Joseph, Jr., New Brunswick, N. J.
Dennison, John Manley, Keyser, W. Va.
Drauglis, Edmund, Philadelphia, Pa.
Earle, William Edward, East Bridgewater, Mass.
Feldstein, Robert Schmidt, New York, N. Y.
Frolen, Lois Jean, Eugene, Oreg.
Gingrich, Cynthia Louise, Lebanon, Pa.
Janousek, Lucile Frances, Gypsum, Kans.
Johnson, Donald Bruce, El Cerrito, Calif.
Larson, David Clarence, Cloquet, Minn.
Lyser, Katherine May, Lafayette, Calif.
McColm, Douglas Woodruff, Andover, Mass.
Martin, Mary Helen, Hyattsville, Md.
Norris, Daniel Howard, Sylvania, Ohio
Novotny, Eva, Forest Hills, N. Y.
Rosen, Robert, New York, N. Y.
Shteir, Owen Aaron, Princeton, N. J.
Sibilia, John Talbot, Newark, N. J.
Sieffert, Paul Louis, Pittsburgh, Pa.
Spencer, Dana Royce, Arlington, Mass.
Stewart, James Buchanan, Harrison, N. Y.
Wharton, Lennard, Exeter, N. H.

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SCENES FROM TALENT INSTITUTE—Top left, ten top winners pictured with Dr. Henry De Wolf Smyth and Dr. Harlow Shapley; top right, the two highest winners being congratulated by Dr. Smyth and Dr. Gwilym A. Price, president, Westinghouse Electric Corp.; 3, Dr. Selman A. Waksman addressing the Institute; 4, Dr. John W. Coltman, demonstrating fluoroscopic X-ray work to the group; 5, Dr. Dean Cowie shows a group of the winners the Carnegie Institution atom smasher; 6, Dr. E. U. Condon, director, National Bureau of Standards, talks with some of the winners; 7, Dr. Norman H. Topping and Dr. Dean Burk, National Institutes of Health, discuss public health problems with the winners; 8, Watson Davis welcomes a group of winners.

ENGINEERING

Full-Size Mines Tested in Laboratory

➤ FULL size mines can now be tested at the Naval Ordnance Laboratory, White Oak, Md., in a giant temperature chamber to check effects on working parts of extreme temperature changes when the mine is dropped from airplanes at high altitude into the ocean.

This new chamber, just completed, has already been used for one test, it was revealed. It is made of stainless steel, and is 30 feet long, eight feet wide and eight feet high. Temperatures within it can be changed from 200 degrees Fahrenheit to 100 degrees below zero. Humidity can be controlled. The chamber is equipped with six compressors and ten pumps.

It has a small door on one side through which men can enter to examine a mine. In the test made, the mine was at an extreme low temperature. After a check-up, a huge door at one end was opened and warm air rushed in. Then the mine was ready to roll out and be plunged into a nearby sea-water tank.

The procedure simulates what happens to a mine when dropped from high altitudes into the sea. At a high altitude the war-weapon is subjected to a low temperature. Passing through the atmosphere on its way to the ocean, it becomes subjected to heat. The sudden plunge into the sea cools it rapidly.

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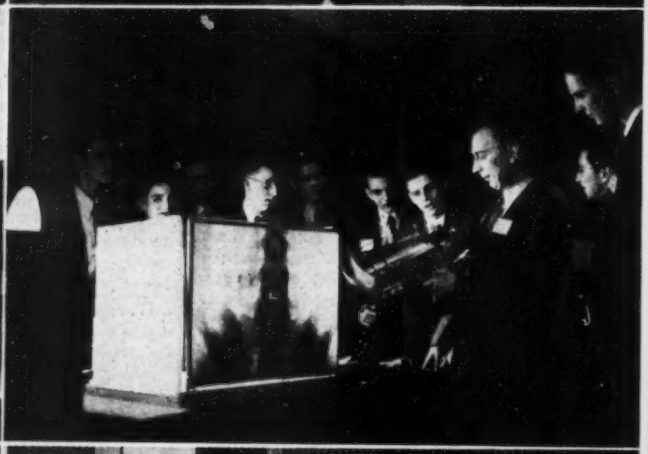
● RADIO

Saturday, March 24, 1951, 3:15-3:30 p.m., EST

"Adventures in Science," with Watson Davis, director of Science Service, over Columbia Broadcasting System.

Brigadier General Leslie E. Simon, General in Charge of Ordnance Research, U. S. Army, and member on Research and Development Board, Ordnance Committee, will discuss "Recoilless Weapons."



GENERAL SCIENCE

College Students Deferred

Selective Service director will soon announce plans for deferring through next year men who are in upper brackets in class standing and college aptitude tests.

➤ COLLEGE STUDENTS, now facing the draft at the end of this school year, will be deferred through next year provided they are in the upper brackets of their classes, Science Service has learned. Plans to defer those students, based both on standing in class and a college aptitude test, will shortly be announced by Selective Service Director Lewis B. Hershey.

General Hershey conferred with Defense Mobilization Manpower Director Arthur B. Flemming, Assistant Secretary of Defense Anna M. Rosenberg and Secretary of Labor Maurice Tobin on the plan for college deferment. It is expected that announcement of the scheme will reverse the trend of voluntary enlistment of many college students and carry over the present deferment until June 1 through to next year for more of them.

Dr. Flemming has not yet accepted the plan, although General Hershey, Mrs. Rosenberg and Secretary Tobin are said to be in favor of it.

The plan calls for the testing of more than 1,000,000 college students. Students may stay in college next year if they receive the equivalent of more than 120 on the old Armed Forces Classification Test. In addition, this year's freshmen in the upper half of their classes, sophomores in the upper two-thirds and juniors in the upper three-quarters, regardless of their test score, will be deferred through next year.

Dr. Flemming will shortly call a meeting of prominent educators to review the plan and advise him on it. Since most educators have endorsed this proposal, which stems out of an advisory committee to Selective Service, Dr. Flemming's approval is expected.

General Hershey told Science Service that the preliminary work on the tests has been done, but that, of course, printing the more than a million tests awaits executive approval. He indicated that time is becoming an important factor, since the tests must be given before the end of the school year.

It looks now, General Hershey said, as if next year's freshman class will largely be unaffected by the draft. He based that opinion on the progress of draft legislation now up before Congress.

General Hershey personally made the decision that both the test and the standing in class would be used as criteria for deferment. He pointed out that perhaps some lazy boys who are smart will be deferred, but also, some hard workers who are not smart will make the grade too. Also, he said, the smaller colleges will not suffer so much under this plan.

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ENGINEERING

Wind Tunnels Now Used To Test Signboards

➤ WIND TUNNELS, used in designing airplanes, can also be useful in designing things planned to be earthbound, such as outdoor advertising signboards.

The University of Michigan's Engineering Research Institute is employing a wind tunnel to test a model advertising sign. Information on the amount of wind stresses it can withstand will be used in designing sturdier signs.

A wind of 70 miles per hour is sent against a model sign 12 inches high and 24 inches wide. Half the model has tiny holes in it and a measuring device connected with the holes registers the pressure distribution and the force of the wind.

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MEDICINE

X-Rays at the Front

By new process, X-rays can be developed within one minute and developed in daylight, without any fluids or solutions. Picture appears on paper.

➤ X-RAYS will soon be moving up to battalion aid stations right behind the front lines to help speed our wounded men back to health.

Army and Navy surgeons will be able to locate broken bones and shell fragments and operate to repair the injuries almost on the battlefield, instead of having to evacuate the wounded to hospitals in the rear equipped with dark rooms, developing fluids and special technicians.

This change, along with equal benefits to civilian accident victims and patients undergoing operations, comes from a new X-ray process demonstrated to Rear Admiral Lamont Pugh, Surgeon General of the Navy, and other Naval medical officers at the Naval Medical Center, Bethesda, Md.

With the new process, X-ray pictures can be developed within one minute, instead of the half hour or more now required. They can be developed in daylight, without any fluids or solutions. And because the picture appears on paper, instead of transparent film, no special illumination is needed to examine it. The film holders are designed so they can be used with any conventional X-ray machine in any hospital.

The new process, expected to "revolutionize care of the wounded," is based on an invention by Edwin H. Land, scientist-president of the Polaroid Corporation, Cambridge, Mass. Development of it for practical X-ray purposes was done by the Picker X-ray Corporation of Cleveland. It was tested by the Naval Medical Field Research Laboratory at Camp Lejeune, N. C., for X-ray use by the armed forces.

The X-ray pictures are taken on polaroid film sheets about 10 by 11 inches. The exposed film sheets can then be run through ringers in a small portable box and within one minute are ready for the doctor's examination. Initial production will be made available to the armed forces.

Use of X-ray machines on shipboard will be greatly facilitated, Naval medical authorities pointed out. This is because the new process eliminates the tanks of developing fluid which often spills when ships pitch and roll on rough seas.

The dry process will eliminate the danger, present in civilian hospitals also, of spilling the highly inflammable developing fluids which often happens when films are removed wet for quick examination.

In the emergency wards of civilian hospitals, X-rays of accident victims can be made available immediately with the new process, regardless of the time of day or night. At present, patients and doctors often have to wait overnight before the dark room technician arrives to develop the film.

The new process also will greatly speed operations requiring X-rays during the course of the operation. With conventional X-ray methods, patients sometimes must wait on the table under anesthetic for 45 minutes while the X-ray picture is being developed. Risk to the patient as well as time will be reduced with the new, one-minute developing.

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MEDICINE

Viruses Can Help Man As Well as Harm

➤ VIRUSES are generally looked on as enemies of man because they cause some of our worst infectious diseases. Poliomyelitis, influenza, mumps, measles, smallpox, sleeping sickness, one kind of pneumonia and the common cold are examples. But not all viruses are hostile to man and some may become powerful allies in the war against disease, Prof. Max A. Lauffer of the University of Pittsburgh pointed out in a report to the American Chemical Society.

Some of man's greatest enemies. including insects and bacteria, also suffer from virus diseases. This, Prof. Lauffer explained, is the basis for hope that some viruses may aid in protecting human health.

Viruses which afflict bacteria have a special name, bacteriophage.

"There is a very real possibility that, when the mechanism of infection of bacteria by viruses is adequately understood, bacteriophages may prove to be powerful antibiotic agents," Prof. Lauffer said.

"Bacteriophages represent natural enemies of bacteria. Why haven't they been used successfully as antibiotics? I believe the answer is that we do not know enough about the fundamentals of the interaction between bacterial viruses and bacterial cells."

Despite all the talk about "virus X," the "cold virus," and the "poliomyelitis virus," Prof. Lauffer said, many people do not know how viruses differ from other disease-producing agents such as bacteria. In many respects viruses resemble bacteria, he conceded, but they differ in at least two important respects.

First, viruses are smaller than most bacteria—so small that they cannot be seen with an ordinary microscope, and will go right through a filter which will stop bacteria. Second, viruses differ from most bacteria in being absolutely dependent upon the living tissue of hosts for their reproduction and growth.

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TRAINED PORPOISE—Flippy jumps through a hoop to demonstrate to his trainer, Adolph Frohn of Marine Studios, Marineland, Florida, that he is not too dumb to learn a few tricks.

MEDICINE

Snakes Battle Cancer

Rattlesnake that died with lump on its neck started experiments in transplanting tumorous growths from dead snakes to live ones and from one variety to another.

➤ RATTLESNAKES, bothered by cancer just like humans, now are in the battle against the nation's second most deadly disease. The dangerous snakes have joined the crusade at New Mexico University in a study probing tumorous growths in reptiles. Guiding the work is 34-year-old William Jones-Burdick, University herpetologist and biology professor, who never expected to be doing it.

The study began more than a year ago when he discovered a rattler with a lump on its neck. The snake soon died and an expert's examination brought up a diagnosis of cancer, the ninth reported case of its kind. Prof. Jones-Burdick's interest was aroused. He rolled up his sleeves and got the project under way.

Other experts consulted since question the cancer diagnosis and suspect an animal or plant parasite. But in any case, the project is not invalidated. That is because cancer results from abnormal cell growth, and much cancer research is aimed at a better understanding of cell growth in general in an attempt to get at the heart of the problem.

Prof. Jones-Burdick's work, aimed chiefly at understanding the mystery cell that kills his snakes, simultaneously has been going in two directions:

First, he has been successfully transplanting the tumorous growth from dead rattlesnakes to live ones. The transplanted tissue causes a tumor in the live snake. Cells from the tumor somehow travel to vital organs, attach to those and grow, crowding out the vital organs and causing death. Four to six months after being transplanted with only one exception, the disease kills the snakes.

Second, Prof. Jones-Burdick has been transplanting the lumpy growth from rattlesnakes to bull snakes and other varieties of snake. This is about as unusual as transplanting the growth from a horse to a man. However, it may be a characteristic limited to cold-blooded animals. Prof. Jones-Burdick does not know yet.

Like many other researchers in the field, he is not looking for a cure for cancer. His aim is to understand the exact nature of the deadly cell that kills his snakes and perhaps so to get a better understanding of cell growth in general. He would be pleased if over a span of years he uncovers a small bit of information that, when fitted with information uncovered by other researchers, would fall into a pattern for conquest of cancer.

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RESOURCES

Plenty of Crude Oil

➤ THERE IS plenty of crude oil, natural gas liquids and natural gas underground in the United States, at least for the near future, the American Petroleum Institute and the American Gas Association report. They back their statement by figures.

Proved reserves of these sources of power, heat and hundreds of chemicals were boosted to new all-time peaks during 1950, they declare in a joint report. This report covers new discoveries made during the year, and revisions of previous estimates and extensions of known pools.

Total new supplies of crude oil and natural gas liquids developed in 1950 amount to an estimated 3.3 billion barrels. With total production of liquid hydrocarbons at close to 2.2 billion barrels, this produced a net increase of more than 1.1 billion barrels in proved reserves.

Proved reserves of liquid hydrocarbons at the close of 1950 were estimated at 29.5 billion barrels. Proved reserves of natural gas were estimated at 185 trillion cubic feet. This is a net increase of 5.2 trillion cubic feet, but production exceeded the new discoveries. Production during 1950 is estimated at 6.8 trillion cubic feet.

The proved reserves of crude oil, natural gas liquids and natural gas referred to in the report apply only to those reserves whose locations and extent have been proved and measured. They do not include any estimate of oil or gas which may underlie the vast untested American acreage which appears favorable to the accumulation of oil and gas.

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ENTOMOLOGY

Range Pest Beaten By Imported Beetles

➤ SCIENTISTS have apparently defeated the Klamath weed, a noxious plant pest on California range lands, by importing a beetle from Australia and letting it eat the weed.

A report by J. K. Holloway, USDA entomologist, and C. B. Huffaker, University of California College of Agriculture, revealed that the beetle is now established on all 21 of the California counties where the Klamath weed exists.

In Humboldt County, for example, 5,000 adult beetles were released in 1946; last year 3,000,000 were collected for redistribution to other areas. Even so, the beetles removed were only a small part of the total population.

In addition, the beetles disperse by walking and flying—thus increasing the acreage in which they are effective. In four years' time, they spread a distance of six or eight miles, and instead of covering one small field are found over 100 square miles.

The Klamath weed is especially detrimental to sheep and cattle. Although not palatable, livestock will graze on it when no better forage is available. Eating the weed causes the white-skinned parts of an animal's body to become sensitive to sunlight. Blisters form on these areas when exposed to the sun and the animal becomes scabby, sore-mouthed and underweight.

First discovered along the Klamath river in 1900, the weed gradually spread over about 400,000 acres of California's open-range by 1944, greatly cutting its value as grazing land by displacing desirable forage.

Hardy and difficult to control, the plant pest will survive mowing and heavy grazing by sheep and goats. And it has a rapid rate of recovery on over-grazed or burned-over range.

But when the imported Australian beetles are turned loose on the Klamath weed, it soon succumbs. The beetles eat the leaves, photosynthesis comes to a halt and the root system weakens. This is by far the most economical, large-scale method of control.

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AGRICULTURE

New Potato Resistant To Two Diseases

➤ HOUSEWIVES and Midwest farmers will cheer the Cherokee if this new potato variety lives up to reports on it.

Released jointly by the U. S. Department of Agriculture and the Indiana and Iowa Agricultural Experiment Stations, the Cherokee is the first potato variety to carry high resistance to both blight and scab disease. It holds promise for production on Middle Western soils now so badly infected with scab organisms that a susceptible variety like the Irish Cobbler cannot be grown.

The Cherokee has given high yields and a high percentage of U. S. No. 1 potatoes when tested on muck soils. It has an attractive smooth white skin and good cooking quality and is particularly good for baking because of its high specific gravity.

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AERONAUTICS

Blades Made By Extruding

Instead of welding together two separate parts, hollow steel propeller blades are now made in one piece by forcing hot metal through a die.

➤ A NEW mass-production method of producing one-piece, hollow-steel propeller blades by forcing hot metal through a die was revealed by the Curtiss-Wright Corporation.

Technically, it is an extrusion process. The white-hot chrome-nickel molybdenum steel billet is formed first into a tube. When flattened, formed and finished, it becomes a one-piece propeller blade.

Blades now in use are usually made of two parts which are then welded together. The new one-piece blade is claimed to provide greater resistance to the severe fatigue and other stresses to which propellers on turbo-prop planes are subjected.

The extrusion method of shaping metals in a continuous form by forcing highly-heated materials through a die is not new, but it has until now been used on relatively simple forms. As far as known, the hot extrusion of steel to make anything approaching the complex shapes and tapered thickness required in propeller blade manufacture has never before been tried.

Advantages of the extrusion process in propeller-blade making include a saving in materials, skilled manpower, costly machining, floor space required for manufacturing and tools. Operations in propeller manufacture, which now require hundreds of hours of hand work, are reduced by the new methods to a series of three steps which can be accomplished in minutes.

The development of the process is the result of research by Curtiss-Wright scientists and engineers in a program sponsored by the U. S. Air Force. Production for the Air Force already has been initiated. Plans are being made to supplement welded types now being manufactured with extruded blades as rapidly as possibly.

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NUTRITION

Grow Your Own Vitamins If You Have Garden

➤ MANY FAMILIES are planning gardens this year partly as an aid to national and civil defense and partly as an aid to their own pocketbooks in these days of high food costs. Health can be served in three ways through home gardens. One is through the better nourishment provided when food budgets are limited. Two is through the increased outdoor exercise. Three is through the lift in morale that comes from growing and harvesting your own food crop, however small it may be.

In deciding what vegetables and fruits to plant, be guided by the Basic Seven food plan. This plan divides the foods we eat into seven groups according to their nourishing qualities. Nutrition-conscious housewives follow it in planning the family meals.

One group is made up of the foods that can be the mainstay of the diet for vitamin A. This includes green, yellow and leafy vegetables such as spinach, kale, green peas, lima beans, snap beans and carrots. And you eat one or more servings from this group each day.

Two others of the Basic Seven food group can come from the family garden. One of these is the vitamin C rich foods from which one or more daily servings should be eaten. You can't, unless you live in Florida or California, have oranges and other citrus fruits in your garden, but you can have such other vitamin C fruits as melons and strawberries. And you can have tomatoes, cabbage, turnips, salad greens, and green peppers. Any of these provide vitamin C when served raw and tomatoes provide it raw or canned.

The third Basic Seven group that can come from the home garden is a catch-all group. It includes potatoes, beets, onions, turnips and radishes. These foods do their part in nourishing you by adding to the supply of various vitamins, minerals and other materials the body needs. Some of them add flavor that makes you want more of the other foods. Beets and turnips yield double harvests in their roots and their fresh green tops. You can add the green tops to your leafy vegetable group. Two or more daily servings from this third group are called for in the Basic Seven plan.

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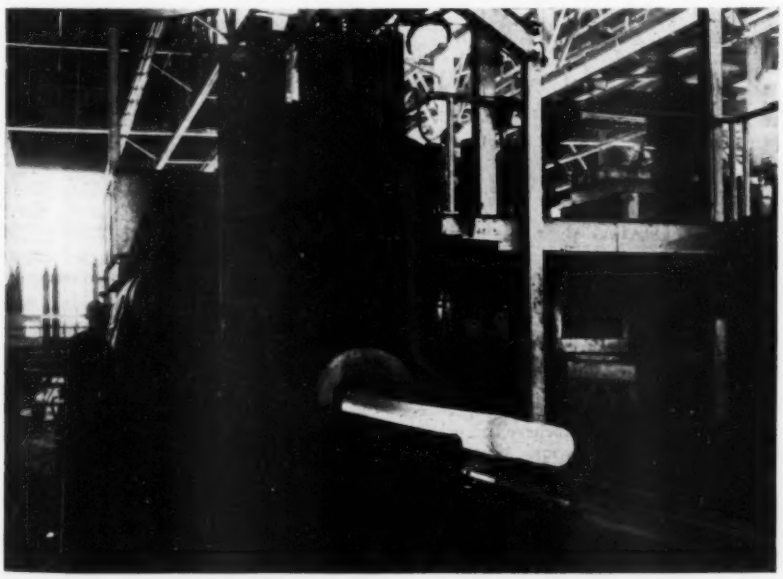

EXTRUDED—A white-hot propeller blade tube is shown here coming from the press following the third and final extrusion.

DENDROLOGY

Increase Income by Harvest of Timber

➤ HOW BEST to harvest timber is explained in a handbook just issued by the U. S. Department of Agriculture.

Many owners of small woodland plots could increase their income by doing their own logging, the handbook states. Logging operations include not only saw timber, but also pulpwood, fuel wood, veneer and other forest products. Over 300 photographs and drawings in the handbook help to show the tools needed and the methods used to harvest timber in the most efficient and economical way.

"The products of logging operations are critically important in the current defense effort," states Fred C. Simmons, logging specialist at the Northeastern Forest Experiment Station, Upper Darby, Pa., who wrote the book. (NORTHEASTERN LOGGERS' HANDBOOK, *Govt. Printing Office*. 75 cents).

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RADIO

Invention Limits Flicker In Color Television

➤ A NEW method of changing the balance of different portions of a color television system so as to reduce flicker, invented by Dr. Peter C. Goldmark, director of engineering, research and development of the Columbia Broadcasting System, was granted a patent by the government.

Flicker may result, Dr. Goldmark explained, when signals of different light intensity are sent successively through different optical paths. His invention, which is assigned to C. B. S., is designed to reduce this flicker.

The invention makes use of an electron multiplier for multiplying a composite video signal. It also sequentially alters the voltage applied to one or more of the stages of the multiplier, and this alteration is in synchronization with the alternations of the different component portions of the composite video signals.

The invention contemplates doing the job in the transmitting tube. While this is preferred, the patent application explains, it could be done in a separate tube and then the apparatus could be used either at the transmitter or the receiver. Dr. Goldmark, of New Canaan, Conn., received patent 2,543,772.

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CHEMISTRY

New Evaporator Gets Fresh Water from Sea

➤ APPROXIMATELY 30 gallons of distilled water are produced from sea water with one pound of fuel in new distillation equipment of the compressor type revealed at the U. S. Army Engineer Research and Development Laboratories. It is for use by military men in areas where no fresh water is available.

This equipment is a version of apparatus developed during World War II that produced an equal amount of distilled water with an equal amount of fuel. But the old apparatus was not satisfactory because scale from the salt water formed in the tubes of the evaporator, necessitating frequent shutdowns for cleaning.

The improved equipment, developed as a result of basic research at the University of California sponsored by the Engineer Corps, provides a surface outside the evaporator which collects much of the scale-causing salts before they get inside the evaporator.

In the device what is called a contact stabilizer is used. It consists of a metal shell containing sand, limestone or other material through which brine from the evaporator is circulated by upward flow at a rate many times that of the sea water entering the evaporator.

The larger the surface of contact material provided, the greater the control against scale formation. Scale forming within the evaporator has been reduced to five percent of that formed without the control.

A garrison type thermocompressor distillation unit, electrically operated and incorporating the scale prevention principle, is now being service-tested in Bermuda. It weighs 40 tons but is constructed in sections which permit easy moving. It is designed to operate six months without stopping for scale removal.

Science News Letter, March 17, 1951

INVENTION

Moves in Chess Can Now Be Recorded

➤ PERMANENT records of the individual moves in a chess game can be made with a chessboard on which two Czechoslovakians received American patent 2,543,339.

It is claimed as an improvement over other so-called automatic-recording chessboards because records are made without effort on the part of the players and without diverting their attention from their playing. Also the records can be reviewed without the necessity of playing the game over again.

This board has a tiny slit in each square through which, at each move, a mark can be made with a pencil on a movable recording sheet of paper below. The record sheet is moved forward relative to the board itself so that only a single mark can be made for each square.

The inventors are Josef Karel Simunek and Josef Jan Simunek. Their address is Ricany, near Prague, Czechoslovakia.

Science News Letter, March 17, 1951

ZOOLOGY

"Feather" on Tail Shrew's Mosquito Net

➤ A TINY MALAYAN tree shrew that carries its own mosquito netting around with it on its tail has been added to the mammal collection of the Smithsonian Institution.

The netting is an extension on its three-inch long naked tail and looks exactly like a feather. When the creature sleeps it twists its tail around so that the feather covers its face. This, scientists believe, may serve to protect it against mosquito bites.

The tail extension is not really a feather, scientists say, but it looks exactly like one. Because of this it was named the pen-tailed tree shrew. The animal is the size of a small rat and little is known of its habits. One kept in captivity slept all day and came out at night.

Science News Letter, March 17, 1951

IN SCIENCE

PHARMACY

Cortisone Output To Be Tripled

➤ PRODUCTION of cortisone, for arthritis and other ailments, will be tripled or quadrupled by the middle of next year, officials of Merck and Co., manufacturers, predict.

The increased output is expected to come from a new plant now being built near Danville, Pa., and from expanded production and further improvement in yields from the process at the plant at Rahway, N. J.

A black market in cortisone is rumored. But the present shortage, Merck and Co. officials declare, is caused "by a problem more fundamental than black marketing.

"This problem is one of supply. Merck is producing enough Cortone (name for the Merck brand of cortisone) to take care of the needs of tens of thousands of patients, but the demand for cortisone involves hundreds of thousands of people.

"This demand cannot be satisfied by present methods of manufacture. The present starting material in the manufacturing process is cattle bile, an organic substance limited in supply.

"Before cortisone can be made in sufficient quantities, a new, more plentiful starting material will have to be found, or a complete synthesis discovered by the chemists and research workers."

Science News Letter, March 17, 1951

HORTICULTURE

Once-Vast Swamp Now Yielding Food Crops

➤ HYBRID CORN and other crops were harvested for the first time last fall from a centuries-old, vast French swamp—the beginning step in a long-term project to make this once-useless land productive.

The entire 5,500-acre swamp has now been drained, and a strip of 370 acres has yielded a harvest of corn, potatoes, beets and grain. Known as the Marais Vernier, the desolate swamp is south of the mouth of the Seine in Normandy.

For over 1,000 years, attempts have been made to clear this swamp, but none of them met with the success of the present try. About $335,000 from Marshall plan counterpart funds helped to make the project possible. Within ten years, it is expected that the entire marsh will have been transformed into farm land, giving France much needed food.

Science News Letter, March 17, 1951

ENCE FIELDS

PSYCHOLOGY

Making Sub Livable Helps Reduce Weight

➤ REDESIGNING a submarine to make it more livable is the job Lt. Comdr. Dean Farnsworth of the U. S. Naval Submarine Base has been tackling. Indirectly it has led in many instances to a reduction in weight.

Lighting fixtures have been redesigned to decrease eye strain, and glare has been reduced through use of new materials, Comdr. Farnsworth told members of the Inter-Society Color Council meeting in Washington, D. C.

Submarine interiors used to be painted white or gray; now they may be subdued shades of green or red. Tans, browns, reds and greens were introduced because men as a rule prefer walls of these colors.

Passageways also have been remodeled. Plywood, luxurious to look at and light in weight, has proved an easy-to-clean material for use in passageways frequented by men greasy from working with machinery.

Laminated plastic is the latest in table coverings for subs. The plastic is bonded on aluminum backed with aluminum honeycomb and weighs only a third as much as the traditional linoleum. Thus lighter subs as well as those of increased livability are on the way.

A new paint base developed to cut down glare was exhibited under fluorescent light by Comdr. Farnsworth, who pointed out that it also is easy to clean.

Science News Letter, March 17, 1951

SAFETY

Farmers, Gardeners Should Plan Safety Program

➤ RIGHT NOW, before their busy season starts, is the time for farmers and home gardeners to plan a safety program for themselves and families. Take a look around the place and see if you can spot potential accident and fire hazards and then eliminate them. Here are some simple precautions to follow:

Have place for things and keep them there.

Avoid storing loose materials overhead in the rafters.

Keep things out from underfoot as much as possible. It is easy to trip over a pitchfork handle.

Farm buildings with lights should have the wires inspected. Have a dry place to stand when throwing switches.

If using a lantern, hang it outside the barn and provide a secure place to hang it.

Avoid smoking or lighting matches around the barn. (Remember this, those of you who plan to work on farms this summer.)

Do not store gasoline or kerosene in the barn.

Oily rags or waste should be burned.

And here are some additional pointers: Learn to lift heavy objects correctly to avoid strains, sprains, and ruptures. The trick is to use leg instead of back muscles. Keep your back as nearly vertical as possible, feet close to the object being lifted and about 10 inches apart. Keep the hips lower than the shoulders and the arms straight. Don't try to lift something too heavy for your strength. Get help or rig a block and tackle.

A gradual physical toughening program may help to reduce injuries due to fatigue and strain.

Inexperienced helpers should learn to be careful about handling farm machinery to avoid accidents to themselves and others.

Science News Letter, March 17, 1951

AERONAUTICS

Atomic Plane Engines Feasible But Not Probable

➤ THE RECENT statement attributed to Air Secretary Thomas K. Finletter that an atomic energy aircraft engine is feasible does not mean that this type of power may go into aviation in the immediate future.

It means, however, that progress has been made in the problem of utilizing nuclear energy for the propulsion of aircraft, and it holds out hope for the future.

Much work has been done in the past two or more years at the Atomic Energy Commission Oak Ridge, Tenn., plant in studying the problems of applying atomic energy to aviation in a project called NEPA for short. The letters stand for Nuclear Energy for the Propulsion of Aircraft. Much of this was done under a contract of the U. S. Air Force with the Fairchild Engine and Airplane Corporation.

This contract terminates on April 30 this year, and Fairchild has announced that most engineers on the atomic plane project will be transferred to a new phase of the work in Ohio.

Many scientists believe that the first application of atomic energy will be in ocean vessels, perhaps in the submarine. Work directed to the use of nuclear energy to propel a submarine is under way at the Knolls Atomic Power Laboratory, Schenectady, N. Y., operated by General Electric.

Some general facts about the submarine atomic reactor being developed at this laboratory were recently revealed by K. A. Kesselring of the staff. It will use, he said, an atomic reactor operating at very high heat to produce heat. The heat will develop steam to operate steam turbines.

Science News Letter, March 17, 1951

PUBLIC HEALTH

Rheumatic Fever Now A Leading Child Killer

➤ RHEUMATIC FEVER and heart disease is now one of the leading killers of children in the United States, ranking second only to accidents, Dr. George Wolff of Washington, D. C., reports. (JOURNAL, AMERICAN MEDICAL ASSOCIATION, Mar. 10).

Girls are more often victims than boys, his statistical study shows.

The Northeast, especially the Middle Atlantic section of the country, has the highest death rates for this condition, with the Southern and Pacific Coast lower than the average death rates.

The rise of rheumatic fever and heart disease to a leading position as killer of children is not due to an increase in deaths from this condition. Actually, Dr. Wolff points out, the mortality for white children from this condition has decreased between the 1919-1921 period and the 1944-1945 period. The decreases amount to 70% for children from five through 14 years and 60% for children from 15 through 19 years.

Reason for the present high mortality position of rheumatic fever and heart disease is that other childhood diseases have declined as causes of death.

Science News Letter, March 17, 1951

ICHTHYOLOGY

Scientific Fish Story; Fish Operates on Fish

➤ A DIFFICULT surgical operation, colostomy, has been performed by a lamprey, one of the most primitive class of vertebrate animals.

The operation was successful but the patient, an 18-inch pike living in Cayuga Lake near Ithaca, N. Y., died. Cause of death was a fisherman's hook.

The fisherman is Prof. Clarence H. Kennedy of Ohio State University. The case is reported by Dr. W. James Leach, also of Ohio State, in the scientific journal, SCIENCE (Feb. 23), as "interesting rather than significant, but unparalleled in the field of general zoology."

A colostomy operation consists in making an opening of the bowel through the abdominal wall when part of the bowel has to be removed, as in cases of cancer.

Parasitic lampreys attack fish, rasping a hole in the flesh and sucking out the blood and tissue juices. When the wound penetrates into the body cavity, the fish almost always promptly dies, Dr. Leach points out. In the case he reports the wound made by the lamprey healed in such a way as to leave an opening into the gut without exposing the peritoneal cavity.

The character of the wound caused it to act as the outlet of the intestine and the original outlet stopped functioning.

Science News Letter, March 17, 1951

CHRONOLOGY

Two Dates for Easter

Roman Catholics and Protestants celebrate the Resurrection of Our Lord on Sunday, March 25. Millions attending the Eastern Orthodox Churches will wait until April 29.

By MARTHA G. MORROW

➤ EASTER this year will fall on two different dates more than a month apart.

Roman Catholics and Protestants will celebrate the Resurrection of our Lord on Sunday, March 25. But for millions attending the Eastern Orthodox Churches, Easter will not come until Sunday, April 29, fully five weeks later.

The reason for this difference in date goes back many centuries to the time our calendar was reformed. The Eastern Orthodox Churches, unwilling to accept orders from Rome, still cling to the old Julian calendar in calculating the date of Easter. Other Christian denominations in computing the Easter date use the calendar as revised in the sixteenth century by Pope Gregory XIII.

At the present there is a difference of 13 days between the two calendars. Those using the Julian calendar find that their March 21, traditionally the first day of spring, comes almost two weeks after the vernal equinox. But Sundays and other days of the week coincide in the two calendars.

"The first Sunday after the first full moon on or after the twenty-first of March," is the general rule for fixing the date of Easter. If this, the Paschal full moon, should fall on a Sunday, then Easter falls on the next Sunday. The Paschal full moon is determined by rules for ecclesiastical computations and should not be confused with the real full moon.

Calendar reformers who object, for commercial reasons, to an Easter late in April should remember that the Gregorian calendar brings Easter much earlier than it would be if we still used the old Julian reckoning. Gregorian Easter Sundays precede the corresponding Julian Easter Sundays by at least a week 74 times during the present century, and precede it by as much as five weeks on 21 occasions, points out Dr. Alexander Pogo of the Carnegie Institution of Washington.

No Fixed Date

Unlike Christmas, the Fourth of July and many other holidays that occupy fixed places on the calendar, the date of Easter changes from year to year according to certain involved calculations. A fixed date for the observance of Easter, the first religious holiday ever celebrated by Christian people, has never been universally accepted because of its historical relationship to the Jewish Feast of the Passover.

The Feast of the Passover celebrates the liberation of the Hebrews from Egyptian bondage. The memorial feast was celebrated on the fourteenth of the month of Nisan, that is, on the first full moon of spring. It was on the day of preparation or the first day of this festival, on a Thursday that Jesus and his disciples ate the Last Supper. The next day, Friday, was the day of the Crucifixion and the following Sunday the day on which Our Lord arose from the dead—the first Easter.

In time a serious controversy arose between the Jewish Christians and those of Gentile descent as to the correct day on which Easter should be observed. To the former, the relationship of Easter to the Feast of the Passover was all-important, and the day of the week immaterial. The Gentile Christians, unfettered by Jewish traditions, insisted that the Resurrection should always be celebrated on Sunday, and placed Good Friday, which commemorates the Crucifixion, on the preceding Friday.

Always on Sunday

The Council of Nicaea in 325 put an end to this controversy by deciding that Easter should always fall on Sunday. The vernal equinox or first day of spring was fixed for March 21. This Council also ruled that if the Paschal or Passover full moon occurred on a Sunday, Easter would be celebrated on the following Sunday so that Easter would always follow the Feast of the Passover and never coincide with it.

So that the same Sunday should be observed throughout the world, the Council ruled that the correct date for the Easter festival should be calculated at Alexandria, then the center of astronomical study. This ruling, however, was not long followed, for St. Augustine writes that in 387 Easter was celebrated on three different Sundays. The Churches of Gaul kept Easter on March 21, those of Italy on April 18, and those of Egypt on April 25.

In practice we do not depend on observation to determine the arrival of spring, or the phase of the moon, but on certain arbitrary, but fairly exact, mathematical rules which make it possible to calculate the date for many centuries in advance or for years long past.

Our present Easter rule, officially adopted late in the sixteenth century, misses the exact date only occasionally for many centuries to come.

This year the first full moon after the beginning of spring comes on March 23. The arbitrary calendar rule puts this full moon on March 22. In either case the following Sunday is March 25, the date we call Easter Sunday.

Easter last fell in March in 1948, there being only two April Easters between, which is almost as low a number as can occur. There are never two March Easters in succession, states the Rev. George W. Walker of Buffalo, N. Y. The shortest possible interval includes a single April Easter in between. This happened last between 1837 and 1839, and will again occur between 1989 and 1991.

After this year there will not be another Easter in March until 1959, which is almost as long an interval as can occur between March Easters. The present century offers four runs of seven April Easters. This record of seven Easters falling in April one right after the other will hold for many centuries, but it will be broken by a run of ten April Easters in a row beginning 2855.

Easter can come anytime from March 22, as it did last in 1818, to April 25, which was the case in 1943. This year for the first and only time this century Easter comes on March 25. The most frequent date for Easter is April 19, the celebration falling on that date, on the average, once in 26 years.

Currently March 24 is the most unusual Gregorian Easter date. Easter fell on that date in 1940, the second time since the Gregorian calendar reform. March 22 holds the record for "absenteeism" in the first thousand years of the Gregorian calendar, an interval of 467 years elapsing between Easter on March 22, 1818, and Easter on that date in 2285.

Passover Month Later

Although usually Easter as calculated by the Roman Catholics and Protestants, and the Passover as reckoned by the Jews, come about the same time, this year the Feast of the Passover falls almost a month later. It begins on Saturday evening, April 21.

The Orthodox Churches insist that the sequence of events be the same as in the Biblical accounts of the Resurrection. Thus some 6,000,000 communicants of the Eastern Orthodox Churches here in the United States, and an estimated 200,000,000 throughout the world, must wait for their Easter until long after the mild days of spring have arrived.

But even the Orthodox churches do not follow the Julian calendar uniformly. The Greek, Syrian and Romanian Orthodox Churches follow a Revised Julian calendar which agrees with the Gregorian calendar in the calculation of fixed Feasts, but the

ORTHODOX—Elaborately-decorated Easter eggs of Russian design, such as these at the Smithsonian Institution, Washington, will be in season over a month after Easter is celebrated by most people in the United States.

calculation of Easter corresponds with the Julian calendar. The Russian, Serbian, Bulgarian, Ukrainian and other Slavic Churches still use the Julian or old calendar exclusively, and thus their communicants celebrate Christmas 13 days after those of the other Orthodox Churches.

The difficulty of frequently having two dates for Easter and even Christmas can be blamed on the fact that the earth takes an uneven time to circle around the sun. The solar year consists of 365 days, five hours, 48 minutes and 46 seconds. In addition, the moon takes 29.531 days—another odd interval—to finish its trip around the earth.

The Egyptians, who calculated the solar year as 365 days, divided the year into 12 equal months each of 30 days, the remaining five days being devoted to festival holidays. Their weeks, however, were ten days long.

Nor did the Julian calendar as instituted by Julius Caesar include any seven-day week. This was an eastern invention, used both by the Babylonians and by the Jews. Not until the fourth century was the week definitely established in Christendom and Sunday proclaimed as the day of worship.

Upon the advice of the Alexandrian astronomer Sosigenes, Julius Caesar adopted 365¼ days as the true length of the year and ordained that every fourth year should contain 366 days. The solar year, however, is 11 minutes, 14 seconds shorter than this, so in the course of 1,000 years the Julian calendar developed a lag of nearly eight days.

In time March 21, marking the first day of spring, came many days after the actual vernal equinox as calculated by the sun. By 1582 it fell on March 11, instead of occurring on March 21, as it did at the time of the Council of Nicaea. Pope Gregory XIII therefore, upon the advice of the astronomer Clavius, ordered the calendar corrected by dropping ten days.

In Roman Catholic countries, where the Gregorian calendar was adopted earlier than in the other Christian countries, the day following Oct. 4, 1582, was called the fifteenth instead of the fifth.

To avoid further displacement of the beginning of spring, Gregory decreed that the rule of adding an extra day every fourth year should be followed except in the case

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of those century years whose number is not divisible by 400. Thus 2000 A.D. will be a leap year, but 1900 was not.

Eleven days had to be dropped by England and the colonies—including America—to bring the calendar in line when the new type calendar was adopted in 1752, almost 200 years after it came into use in some European countries.

But the Gregorian calendar has never been accepted by all Christian Churches, for calculating Easter or even for calculating other Holy days.

Science News Letter, March 17, 1951

MEDICINE

Khellin Aids Angina

More than three-fourths of a group of heart disease patients are helped by drug extracted from a Middle Eastern plant relative of hemlock.

➤ MORE than three-fourths of a group of heart disease patients have been helped by khellin, drug extracted from a plant that grows wild in eastern Mediterranean countries and which is a botanical relative of the hemlock that killed Socrates.

The good results with the drug in trials at Boston City Hospital, Boston, Mass., are reported by Drs. Harold L. Osher, Kermit H. Katz and Donald J. Wagner.

The patients, 32 in all, were victims of angina pectoris. The angina pains became less frequent and less severe in 26 of them, and these 26 were also able to perform more exercise before the angina pain stopped them.

Fourteen of the group had been incapacitated before khellin treatment was started. Of these, nine were rehabilitated to the extent that they could go back to work.

One of these is a 57-year-old man with arteriosclerotic heart disease who has had angina pectoris for 18 months. Progessively lessening ability to exercise forced him to give up his work as a laborer. For several months he averaged two or three attacks of angina heart pain every day in spite of marked restriction of activity. After khellin treatment was started, he had only three attacks in two weeks, and his exercise tolerance increased from 20 to 34 trips on a standard exercise step test.

Continued treatment reduced attacks to one in 43 days and enabled him to perform 54 trips on the two-step exercise apparatus before pain stopped him. He returned to work as a laborer and for three months has been "carrying on a moderately strenuous occupation without difficulty."

Another patient who got similar benefit from khellin treatment for three and a half months has been back on his job and remained in good shape for two months without taking the drug.

Two other patients have also been able to get along for two months without taking the medicine. Such let-ups in the disease sometimes come spontaneously, but in these four patients there had not previously been such improvement.

The khellin was given in the form of sugar-coated pills taken four times a day, after meals and before retiring. Sugar pills identical in appearance were given either before the khellin treatment was started or after a period of khellin treatment, to check on any possible psychologic effect of taking a new medicine.

Details of this trial of the drug are reported in the NEW ENGLAND JOURNAL OF MEDICINE (March 1).

Science News Letter, March 17, 1951

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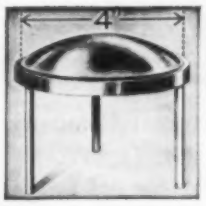

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PHARMACY

Pharmacists Urged To Stock "Bal"

➤ STOCK BAL as part of your public emergency service, the nation's pharmacists are urged in a report from their national organization, the American Pharmaceutical Association (JOURNAL, Feb.).

BAL, short name for British Anti-Lewisite, is at present the only known specific antidote for poisoning by heavy metals such as arsenic, mercury and gold. It was developed in England during the early days of World War II to counteract the effect of Lewisite, poison gas containing arsenic. Kept hush-hush during the war, it was released for civilian use at the end of the war.

The manufacturers of BAL at times have received frantic telephone calls from all over the country asking that a supply of the chemical be flown immediately to the bedside of a patient who has swallowed bichloride of mercury or a child who has eaten rat poison containing arsenic. It has not always arrived in time, the pharmaceutical association reports.

Every hospital and retail pharmacy should have at least a 10-vial package on hand at all times with complete directions for use, Dr. James H. Lade of the New York State Health Department urges. He has recently had a supply of BAL stocked in 128 laboratory supply stations throughout the state for free distribution to all physicians in case of arsenic and mercury poisoning. But, he points out, physicians would not normally turn to a health department laboratory for such a drug.

Many lives would be saved each year, he believes, if the physician could get the drug at pharmacies where he normally would go for a poison antidote.

Science News Letter, March 17, 1951

PROJECT SHOW—Left to right, beginning at top: Robert J. Kolenkow shows his apparatus for measuring the speed of sound; R. E. Simpson, parts of cyclotron; F. J. Ernst, Jr., hand-made telescope with camera; Mary H. Martin, study of chromosomes; N. A. Wheeler with his home-made cloud chamber; Rhea Mendoza showing her study of the Confused Beetle; D. W. McColm, rubber chemistry; Lennard Wharton, new set of organic chemical compounds; John T. Sibilia, instrument for measuring wave intensity; John J. Demkovich, Jr., with his optical instruments; Katherine M. Lyser with turtle she studied; and John M. Dennison with his geological column of Mineral County, W. Va.

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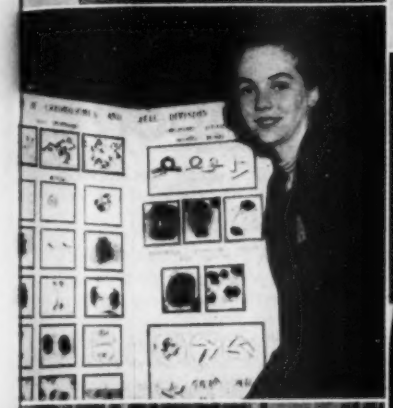

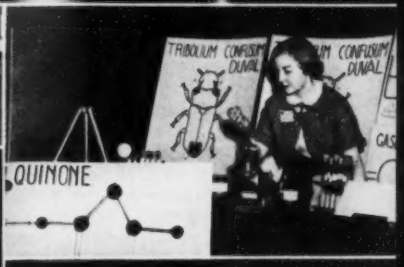
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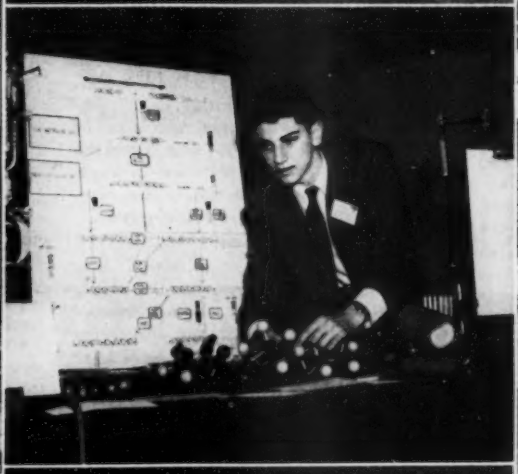

INFRARED SPECTROPHOTOMETER

BOTANY

NATURE RAMBLINGS

Hepatica

➤ MOST of us can bring at best only a patient acceptance to the spring's earliest flower offerings—skunk cabbage and pussy willows and the like. We admit without argument that the naturalists are right when they tell us these are flowers; but what we actually hanker for is a *real* flower, one with bright petals strung around into a collar with some leaves to back it up.

The hepatica satisfies this demand, and it is among the earliest of flowers to do so. It will be out in force to greet the earliest robin, while the branches of the trees above it are still bare, while the first violets are making the most timid of bows. The little white or bluish flowers nestle down on their short, hairy stems among the dead leaves and frequently you can find them by brushing aside these brown blankets, still flecked with the last light fall of snow.

The hepatica is a hardy little plant in any case, for its last year's leaves hang on through the winter, and the new spring crop of foliage does not develop until after the blossoms are gone. A little closer examination of the stems will show that the leaves are thickly clothed with stiff little hairs. These, of course, are not of use to the plant for keeping warm as an animal keeps warm with its fur. Apparently their role is to keep the hoarfrosts of spring from a too close contact with the stem.

Although we are apt to give it little thought, it is nevertheless true that the woods harbor many more kinds of evergreens down at the roots of the trees than can be counted among the pines and spruces and cedars. Of this lesser evergreen population the hepatica is one of the most frequently found specimens.

The sturdy little hepatica appears to have little concern for the length of the winter season, for it will send forth its delicate white or bluish flowers at about this time every year. It does so even though later storms may force it to close its flowers about the stamens and pistil and wait with patience until the last of winter's storms have passed. Then again it unfolds its flowers to the warm kiss of spring's sunshine, harbinger of the many flowers to come.

Science News Letter, March 17, 1951

GENERAL SCIENCE

From the Winners' Reports

KOLENKOW WRITES

"This calculator is elementary, but as a simple prototype of the giant computers, of which one hears so much today, it is valuable as a three-dimensional textbook, wherein one may learn the fundamental operations of electrical computers. In the large machines, the relays are replaced by tubes to gain speed, yet the principle remains the same.

"The machine was constructed over a period of six months, requiring approximately one hundred and fifty hours of labor. The greatest part of this time was spent in designing and constructing the relays. The cost of comparable commercial relays made it unfeasible to employ them.

"The union of electricity and mathematics has proved a fruitful one. The mathematician is no longer hampered by tedious, often impossibly long problems. Weather forecasting by the use of high-speed calculators is only one of the benefits to be derived from these machines.

"Not only have I enjoyed building this apparatus, but at the same time I have been educated in the fundamentals of this comparatively new field. New developments come every month, and the person inexperienced in the art is often bewildered by the complexity of it. I hope that my calculator will serve to help educate them; if it does that, it will be well worth the labor expended on it."—From the report of Robert Kolenkow.

ERNST WRITES

"It is well known that gravitation (which will be used to refer to the effect of falling toward the earth) can be explained in two manners:

"(1) a 'force of gravity' (which will be used to signify a force of attraction between masses) causes the bodies to approach each other.

"(2) Space surrounding great masses is non-Euclidean. A body in this space follows that path which is easiest to follow (the geodesic). In the following article I show that the body will move toward the great mass which is contorting the space.

"Both these methods are valid and yield the same results, but I prefer the latter since it is the easier to propound mathematically. My project consists of applying the curved space method to the study of bodies falling from rest, a very common occurrence. The exploitation of this project necessitated the study of the most modern, the most powerful mathematics ever conceived, the tensor calculus. Therefore, in order to abridge my work as much as possible I refer the reader to 'The Einstein Theory of Relativity' by L. R. Lieber for the background necessary to understand the following exposition."—From the report of Frederick Joseph Ernst.

Science News Letter, March 17, 1951

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AMERICA'S BABY BOOK—John O. Montgomery and Margaret Jane Suydam—*Scribner's*, 457 p., $3.50. Guide to infant and child care in the middle-of-the-road manner currently supported by pediatricians and psychiatrists. Covers material from prenatal period to preschool child. Outstanding photographs.

ANCIENT HISTORY: From Prehistoric Times to the Death of Justinian—Charles Alexander Robinson, Jr.—*Macmillan*, 738 p., illus., $6.00. A connected account of the most important matters from the earliest times to 565 A. D.

THE APACHE INDIANS; Raiders of the Southwest—Sonia Bleeker—*Morrow*, 157 p., illus., $2.00. Second in a junior series about North American Indians, written by an anthropologist who has studied them for many years.

CARNEGIE INSTITUTION OF WASHINGTON: Yearbook No. 49—*Carnegie Institution of Washington*, 220 p., paper $1.00, cloth $1.50. Reports of departmental and cooperative studies and administrative data 1949-50.

GEM HUNTER'S GUIDE—Russell P. MacFall—*Science and Mechanics*, 187 p., illus., $3.00. A key to the gem minerals of the U. S. for the hobbyist or the treasure hunter.

THE GREAT WHALES—Herbert S. Zim—*Morrow*, unnumbered p., illus., $2.00. Eighth of Dr. Zim's science books answers whale questions simply and with many illustrations.

HEALTH AND HUMAN RELATIONS IN GERMANY: Report of a Conference on Problems of Health and Human Relations in Germany, Princeton, N. J., June, 1950.—*Josiah Macy Jr. Foundation*, 207 p., paper, $1.00. Conference sponsored by Foundation with cooperation of Children's Bureau and National Institute of Mental Health (USPHS) with approval of State Department.

THE NATURE OF THE UNIVERSE—Fred Hoyle—*Harper*, 142 p., illus., $2.50. A general theory of the vast problem of time and space, combining generally accepted theories of modern cosmology with the author's own concepts.

NORTHEASTERN LOGGERS' HANDBOOK—Fred C. Simmons—*Govt. Printing Office*, 160 p., illus., 75 cents. Department of Agriculture Handbook No. 6 for inexperienced woodsmen gives how-and-why of care and use of logging tools and emphasizes workers' safety.

NO WOMAN'S COUNTRY: Travel in the Anglo-Egyptian Sudan — Michael Langley—*Philosophical Lib.*, 221 p., illus., $4.50. First-hand information gained during the author's service with the Sudan government; gives the pros and cons of Sudanese independence and Britain's role in the Nile Valley.

NUTRITIVE REQUIREMENTS AND FEED FORMULAS FOR CHICKENS—H. R. Bird— *Govt. Printing Office*, 28 p., illus., paper, 10 cents. Department of Agriculture Circular No. 788 telling what to feed and how to feed it.

PHOTOMETRIC ATLAS OF THE NEAR INFRA-RED SOLAR SPECTRUM—Orren C. Mohler, A. Keith Pierce, Robert R. McMath, and Leo Goldberg —*Univ. of Mich.*, unnumbered p., $4.00. Technical book for workers in spectroscopy and astrophysics, consists mostly of tracings.

PSYCHOLOGY IN USE: A Textbook in Applied Psychology—F. Stanley Gray, Ed., *American Book*, 2d edition, 550 p., $4.75. Essentially the same staff of contributors brings the 1941 text up to date, includes new chapter on "Psychology in Warfare."

REFERENCE BOOKS: A Brief Guide for Students and Other Users of the Library—Mary Neill Barton, Ed.—*Enoch Pratt Free Library*, 99 p., illus., paper, 75 cents. Second edition of valuable aid to library user, not directed to librarians.

STATISTICAL SUMMARY OF EDUCATION—David T. Blose—*Govt. Printing Office*, 50 p., paper, 20 cents. Chapter 1 of the Biennial Survey made by the Federal Security Agency, Office of Education, gives 1947-48 data on education in the United States.

TRENDS IN GERONTOLOGY—Nathan W. Shock—*Stanford Univ.*, 153 p., $2.50. Analyzes the problems of the aging population and provides a groundwork for their solution. Written by the Chief of the Section on Gerontology, National Heart Institute, National Institutes of Health.

THEORY AND APPLICATION OF ELECTRICAL ENGINEERING—Eugene W. Schilling—*Int. Textbook*, 402 p., illus, $6.50. Textbook of essential background information for engineers in general, with special attention to electronics and illumination.

Science News Letter, March 17, 1951

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MEDICINE

Cortisone Helps Fight Against Tuberculosis

► CORTISONE, adrenal gland hormone famous for the relief it gives painful, crippled joints in arthritis, is giving scientists new light on the root of the tuberculosis problem.

Because it acts like a two-edged sword, cortisone would be extremely dangerous to use in treatment of tuberculosis, Dr. Max B. Lurie, of the Henry Phipps Institute, University of Pennsylvania, warned.

Dr. Lurie and Drs. Peter Zappasodi, Arthur M. Dannenberg, Jr., and Irene B. Swartz have been giving the gland chemical to rabbits. They find it has two effects which are direct opposites:

1. Cortisone increases multiplication of tuberculosis germs, or bacilli, inside the cells. This would make it "tremendously dangerous" to give human TB patients.

2. It localizes the germs at the portal of entry and stops their spread through the rest of the body.

If cortisone is stopped, however, this beneficial effect is lost and the animal will die because of the increased multiplication of germs that has gone on under cortisone's influence.

The cortisone studies are part of a search for the constitutional factors that affect susceptibility and resistance to tuberculosis. Cortisone is only one of many chemicals produced by the adrenal glands. When scientists know how an excess of each of these chemicals affects tuberculosis infection, they may have clues to better methods of treatment or of improving resistance to the great white plague. Details of the studies are reported in the journal, SCIENCE (Mar. 2).

Science News Letter, March 17, 1951

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❁ *CONVERTIBLE camera, for use in ordinary photography and also for close-up work in science laboratories, has three removable shutter-lens extension rings which permit work to be done as close as 3.75 inches. The camera without the extension rings focuses as close as two feet.*

Science News Letter, March 17, 1951

❁ *NEEDLE-GRIP thimble, worn in the usual way, has a rough surface, which, aided by thumb-pressure, makes it easy to pull a needle through heavy fabric or leather. The roughened surface that assures the grip is bonded on by a special compound and will last for months.*

Science News Letter, March 17, 1951

❁ *ARTIFICIAL FLOWERS for home decoration are easily made with a kit containing the needed materials. Included are already-dyed blossoms of wood fiber, processed cloth leaves, wire stems and wrapping. Kits are available for geraniums, apple blossoms, dogwood and clematis.*

Science News Letter, March 17, 1951

❁ *POWER transmission belt with teeth, shown in the picture, is made of rubber and fabric and is designed to replace flat belts, V-belts, chain drives and gears in hundreds of applications. This noiseless, non-slip belt makes possible higher operating speeds than other drive mechanisms.*

Science News Letter, March 17, 1951

❁ *CHEMICAL KEG, for shipping and storing corrosive materials, is made of stainless chromium-nickel steel and comes in six-gallon and 15-gallon sizes. The center band portion has unusual strength by special processing so that it provides an adequate and safe rolling hoop.*

Science News Letter, March 17, 1951

❁ *BATTERYLESS flashlight throws a bright, wide-angle light produced from a dynamo by a hand-operated lever. This device, made in Holland, has an unbreakable lens, is pocket-size, and comes in a strong polished aluminum case.*

Science News Letter, March 17, 1951

❁ *GOLF BALL washer, recently patented, is a manually-operated rotary type that will clean four or more balls at a time by rolling them in contact with brushes through a narrow trough of water. Balls feed in automatically from a feeder trough, and are discharged into a holder.*

Science News Letter, March 17, 1951

❁ *NONSPILL piepan for the housewife is made of usual metals but has a broad flat rim in which is a gutter to catch and hold juices that overflow from the pie itself. This pan, recently patented, also has handle pieces projecting from the rim.*

Science News Letter, March 17, 1951

Do You Know?

Waxy varieties of American grain *sorghum* are used in the manufacture of a special type of starch.

Distemper, best known in dogs, is a problem to fur ranchers raising fox and mink.

The use of *propane fuel* for city motor buses is increasing; it is the gas bottled under pressure used in homes outside areas with piped gas.

Coaxial cable, now in use for telephone, telegraph and television communication, will soon form a national network.

Norway reports that *herring* this season are fatter than usual and will therefore yield more oil, important product of the country's fishing industry.

An increase in needed pine seedlings is expected in one national forest by closing the trapping season for *martins;* squirrels eat pine seed, but martins eat squirrels.

Processing time for *bacon* is reduced from two weeks to two days by means of a machine that injects small amounts of a curing solution into the meat in many places at the same time.

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